ANNALS OF SURGERY.

A METHOD OF WIRING FRACTURES OF THE PATELLA.

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THE best method of treatment of fracture of the patella may be said to be still undetermined, many surgeons clinging to the old methods, claiming for them good results and maintaining that the operation of opening the joint and wiring the fragments is too dangerous to life and limb to become a recognized method of procedure; others, with full faith in antiseptics, do not hesitate to open the joint and approximate the fragments, claiming to obtain by this operation bony union with full restoration of function.

While the ideal treatment is that by which bony union with unimpaired function is secured, and while it is a well known fact that by the old methods bony union is the exception and functional impairment of the limb a frequent result of too long a ligamentous band between the fragments, still it is a question whether the non-operative treatment, with inferior results but absolutely free from danger, is not to be preferred to so serious an operation as wiring by the open method has proved to be.

Hamilton says that in all cases treated by himself he has obtained results practically perfect, twenty-five uniting by ligaments not more than one-half an inch in length, while in two cases he believes bony union to have occurred. In no case, says he, was there any impairment of the functions of the limb. The simple and inexpensive apparatus of this surgeon is surely within the reach of any practitioner.

Again, in many cases where the union is by ligament the functions of the limb are impaired *not* as the result of too long a band of union, but because of certain changes which have taken place in the quadriceps. This muscle has atrophied from injury and long disuse, and the function of the limb can be restored by measures which tend to restore the muscle to its normal condition.

That the results of those who do the open operation and wire the fragments are unsatisfactory is well known. The limb and even the life of the patient have been sacrificed; and this, in the face of the fact that the results by the old method were fairly good, though all surgeons have not been able to obtain such cures as were wrought by Hamilton, is surely an unjustifiable risk for any surgeon to subject his patient to, however great his faith in antiseptics; for, as has been pithily remarked, "antiseptic surgery is not cock-sure surgery."

Were the principles of antiseptic surgery less perfectly understood, there might still be a chance that a more perfect technique would produce better results; unfortunately, at this late day there is not much ground for improvement.

That there is something to be desired in the treatment of this fracture, and that all do not obtain satisfactory results by the old methods is well illustrated by the reports of Brunner in 1886. He had operated on forty-five cases of old fracture of the patella in which the function of the limb was so much impaired that crutches were necessary. Of these forty-five cases only eighteen recovered without fever, purulent synovitis occurred in eleven, one thigh was amputated, and three died. Forty-five living patients, though crippled, can scarcely be replaced by forty-two—some, it is true, cured, some worse off than before by reason of suppurative inflammation—one with one leg, and three corpses. If in forty-five cases operated on at a period remote from the injury, when all disturbances in the joint had ceased, such results are obtained, and by a single operator, what can be expected in the case of recent fractures when the joint is presumably irritated and prone to inflammation, necessarily operated on by this surgeon or that surgeon, more or less experienced, as the case may be?

From time to time along with reports of successful cases (seven recently reported by Sir Joseph Lister) come reports of amputation or death following wiring of the patella by the open method, until it seems to be a foregone conclusion that the operation should be abandoned as too dangerous to life and limb. It is never justifiable to subject any human being to an operation so often followed by such grave consequences for an accident not in itself threatening life. which at the most can but result in impairment of the function of a limb.

One of the two factors which impair the function of the limb after this fracture, the atrophy of the quadriceps can, as has been shown by Tilanus, be removed by massage and exercise of the muscle; if now a safe and reasonably certain method of operation can be devised, so that bony union shall be the rule and not the exception, the ideal treatment of the hitherto unsatisfactory fracture will be realized. With this end in view the following method has been devised, and it is hoped that it may seem sufficiently promising and simple of application to merit a trial by the profession.

There are four causes to which the failure of bony union in patellar fracture is attributed; the peculiar blood supply to the bone, effusion into the joint, muscular action and, as has recently been pointed out by Macewen,the engagement of the prepatellar aponeurosis between the ragged edges of the fragments. Since bony union usually occurs when the three latter elements of failure are eliminated, the first cause mentioned may be regarded rather as the fancy of the philosophical anatomist than as an actual source of danger to the success of the practical surgeon.

If now the effusion be removed, the aponeurosis cleared away from the fractured edges, muscular contraction overcome, the bony edges held firmly in apposition, and the nutrition of the quadriceps maintained during the period of rest necessary to a cure, bony union with full restoration of function should result, provided the joint be not infected.

Immediately on the occurrence of fracture of the patella the limb should be placed in a posterior splint, soft sheep's wool sponges applied to the sides and over the front of the knee and snugly held in place by the roller bandage. If ice water be kept constantly trickling on the bandage so as to saturate the sponges and keep them well distended, the most potent factors in the prevention of inflammation and limitation of effusion, rest, elastic pressure and cold will be utilized. At the end of forty-eight hours the knee would in all probability be ready for operation. Strict antisepsis should be observed. If the effusion into the joint be so great as to prevent easy approximation of the fragments, it can be removed by Schede's method. Should the fragments still refuse to come together, Bergmann's plan of freeing the bony attachment of the ligamentum patellæ may be resorted to. If on rubbing the fractured surfaces together the pressure of the prepatellar aponeurosis seem to present an obstacle to union, it can probably be freed by manipulation of one surface on the other; if not readily removed there can be no objection to passing a tenotome into the joint for the purpose of clearing the fractured surfaces. For the purpose of wiring the fragments I have modified Brainard's drill. As small a size as is compatible with the requisite strength is made one inch longer than usual, and at the point is provided with an eye large enough to admit a medium-sized silver or iron wire. Two such drills are necessary. An assistant holds the fragments firmly in apposition, the drill is entered from above, traverses the bone in the long axis of the limb, emerges from the skin below the patella, is disengaged from the handle and left in position, serving to support the fragments temporarily. The other drill is now passed parallel to the first, from below upward, the wire hooked into the eye, the drill withdrawn, and the ends of the wire twisted over the bone. Drill number one is now armed with wire and withdrawn. A few layers of gauze are placed over the patella, and the ends of the wire pushed through. Over all is placed a cap of hard rubber, leather or felt, perforated for the wires, the ends of which are now passed through, drawn tight and twisted. The Bavarian or open plastic splint may now be applied, and if any reaction be feared the sponges may be reapplied, treating the fracture as at first till all danger be passed. Attention should be paid to the quadriceps during recovery.

By this method it is held that the minimum danger of infection is incurred, and a reasonable chance for bony union is secured. Indeed, the joint is not necessarily entered except for the purpose of getting rid of the effusion, or, perhaps, when the aponeurosis is freed. If the fragments are kept closely approximated during the drilling, the drill will not enter the joint at all.

Experiments on the cadaver by Dr. L. A. Greenfelder, of the Michael Reese Hospital, and myself have convinced us of the ease with which this plan can be carried out. The greatest difficulty we encountered was in fracturing the patella without too much comminution. Even then we had no trouble in holding many fragments in close apposition. It is surprising how easy the drill traverses the bone, the only point at which any force is necessary being the point of entrance, the cancellous interior and hard bone at the point of exit giving almost no resistance.

THE RADICAL CURE OF HERNIA.

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AT the annual meeting of the British Medical Association in Dublin, the chief subject of discussion in the surgical section was the Radical Cure of Hernia .Not less than ten papers on this were read, exclusive of numerous speeches. The collective amount of experience represented was very great, amounting to hundreds of cases, individual experience generally ranging from twenty to a hundred cases.

Most of these contributions lost force from the obvious fact that each writer and speaker was entirely, or all but entirely, inexperienced in every form of operation except that practised by himself.

Another thing to take exception to was the apparent vagueness existing in most minds as to the indications which justified an operation. The general idea seems to be that there are a considerable number of herniæ which "cannot be kept up by any form of truss" or which are so large in size that something ought to be done.